Project Management for Managers
Dr. M. K. Barua
Department of Management
Indian Institute of Technology, Roorkee

Lecture - 12
Methods of Project Selection (MCDM-III)

Hello friends, I welcome you all in the session. Let me tell you what we did in previous session, we did solve question using AHP and one question by topsis method. So, in AHP we calculated weight of all those 4 criteria and we also calculates weights of 4 projects based on all those 4 criteria. Now you need not do all those calculations manually there are some calculators available which are freely available you can use those AHP calculators I will show you how to use those AHP calculators. So, on Google you just type AHP calculator right, once you type AHP calculator you will get these options then go at this point AHP calculation software by CGI right just click on that line after that you just write here what is the size of the matrix. So, you can have 3 by 3, 4 by 4 or whatever it is right. So, let us say the size of matrix is 4 by 4 right.

So, once you right size of the matrix then submit this right, now you have got input matrix right. So, there are 4 criteria. So, criteria 1 to criteria sorry criterion 1 to criterion 1 the relative importance is one right similarly 2 2 2 1, 3 to 3 1 and 4 to 4 1. So, let us go for data entry right. So, criteria one to criterion 1 to criterion 2 right let us say this is 9 or let us say yeah 9. So, criterion 2 is 9 times important than criterion 1 right similarly 3 and 1. So, criterion 3 is 1 by 9 time important than criterion 1 then criterion 1 and criterion 4 right. So, this is 5. So, you can choose any these values right of course, you have to ensure that there is a consistency is maintained consistency means what.

Let us say if you are saying that that delivery is more important than price, price is more important than let us say service then you cannot say that service is less important than quality right. So, that consistency has to be maintained similarly criterion 2 to criterion 3 right let us say let it be 4 right I am taking this data arbitrarily right criterion one to criterion 4 let us say two right criterion 3 to criterion 4 let us say 7 right and you just submit you will get these weights calculated by this particular calculator yeah. So, these are different weights right, so this 0.31 0.23 0.41 and 0.32. So, which is the most important criterion here out of 4 criteria you say this is the third one right because it is

weights is highest right. So, most important and then you have got second number 0.31 right then 0.23 and finally, fourth criterion right. So, this how you can solve any AHP matrix using AHP calculator right it let us now move on to the next example by topsis right.

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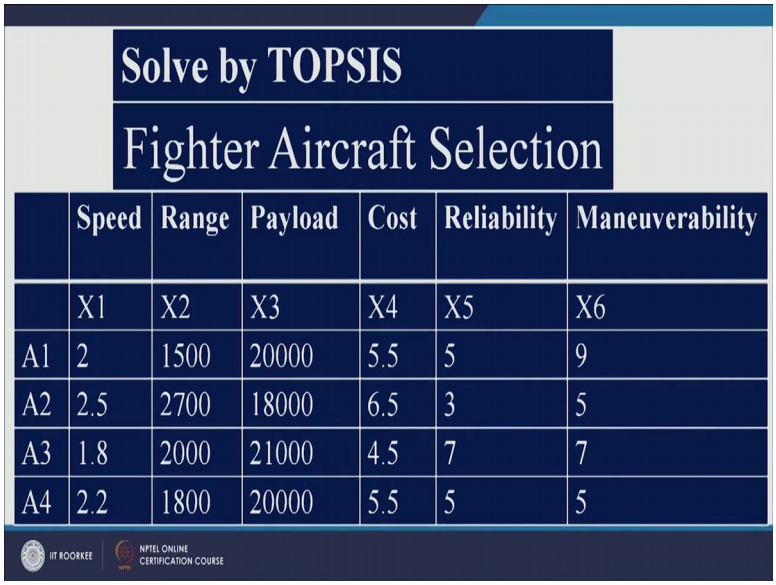

	Speed	Range	Payload	Cost	Reliability	Maneuverability
	X1	X2	X3	X4	X5	X6
A1	2	1500	20000	5.5	5	9
A2	2.5	2700	18000	6.5	3	5
A3	1.8	2000	21000	4.5	7	7
A4	2.2	1800	20000	5.5	5	5

So, we have solved one example this is an example let us say there are 4 different types of aircrafts A 1 to A 4, and there are different criteria and you to select one aircraft out these 4 right. So, you have got speed you have got different speeds of all these aircrafts, different range different payload capacity different cost different reliability in different menu ability right. So, how many men would be there are the men carrying capacity of the aircrafts right. So, let us say this aircraft can carry nine people and so on right similar you have got other values in this matrix right. So, you can solve this question similar to what we have solved right. So, I will quickly go through this.

So, you have got 4 by 6 matrix. 4 alternatives and 6 criteria you just get the initial matrix calculate normalized matrix right then find out weighted normalized matrix. So, multiply normalize matrix with weights right then you need to find out ideal and negative ideal solution. So, let us say this is your ideal solution right and this is your negative idea solution right.

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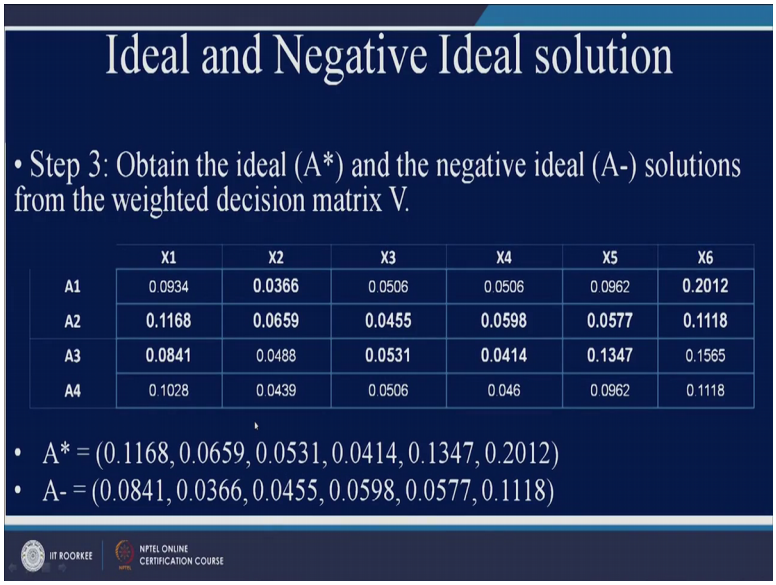

Then what you need to calculate separation measures for ideal solution as well as for negative ideal solution right.

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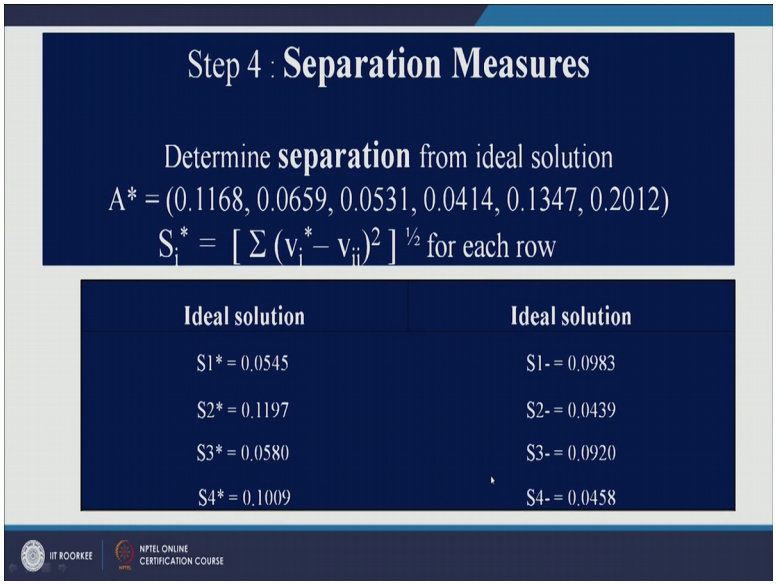

So, this is for ideal solution and this is negative ideal solution right, then finally calculate the relative closeness where you right.

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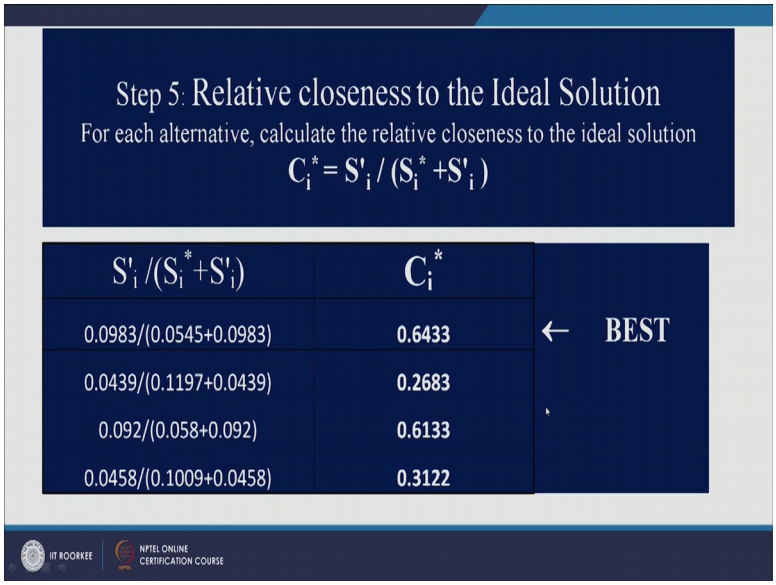

So, as for as this particular question is concerned the highest the closeness the closeness values is 0.64. So, you would be selecting which aircraft A 1 aircraft right then go for A 3 aircraft then A 4 and then finally, A 2 right.

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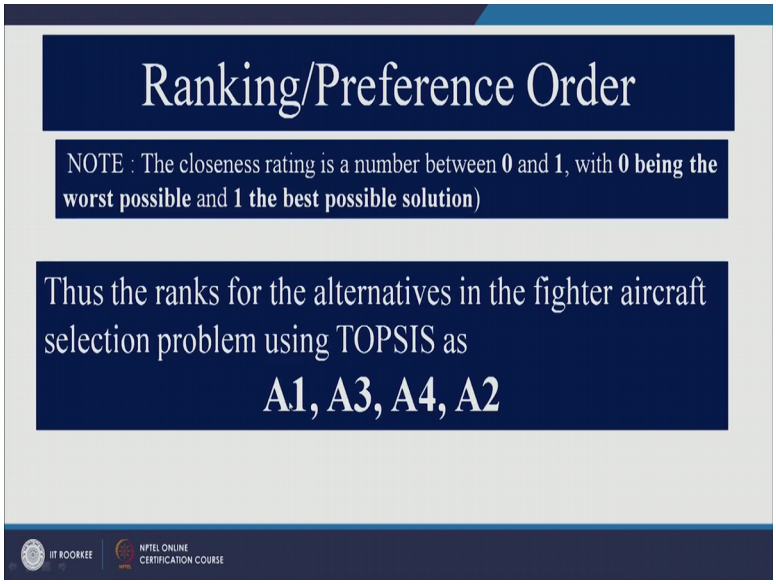

So, this the ranking of these aircrafts right. So, you would be going for A 1, A 3, A 4 and A 2 right.

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Now, let us start our next topic which is on market demand analysis. This is quite an important topic in project management because you need to identify a particular project, and before identifying a particular project you need to analyze demand of a particular product very carefully. So, how to proceed for market and demand analysis? So, first of all what you should be doing there is thing called situational analysis analyze situation.

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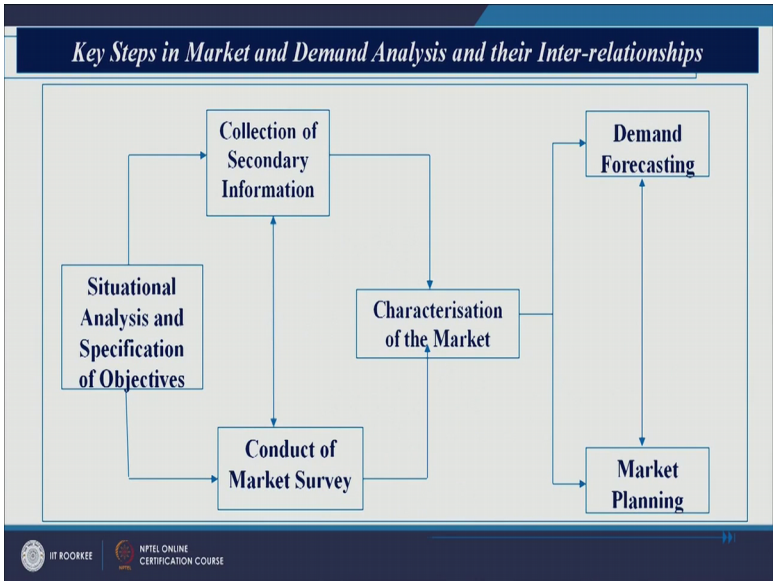

Then go for collection of secondary data, once you are done with secondary data go for market survey this known as primary data collection method, then what are the

characteristics of market and then go for demand forecasting right and then once you forecasted demand of a particular project or a particular product you go for market planning right. So, these are couple of things which we would look at in detail in market and demand analysis.

So, the first is situational analysis what is situational analysis let us say if I want to start any business right. So, what I will do initially I will try to find out who are my customers, who are my competitors, who are middle man involved in that business. So, I will try to find out relationship between a feeling of relationship between product and it is market right. So, I will try together sum insights about the business in the beginning right. So, I will I would like to know what are the preferences of the customers, what strategy is my competitors are using, what kind of practices middle men are using, I should see do I have middle men in that business or not first right after that I should see what are their requirements. So, it in the beginning what you are trying to do, you are trying to find out what are possible stakeholders right and you need to identify their requirements right. So, this is situational analysis; once you are done with situational analysis what you should do? You should go for collection of secondary information.

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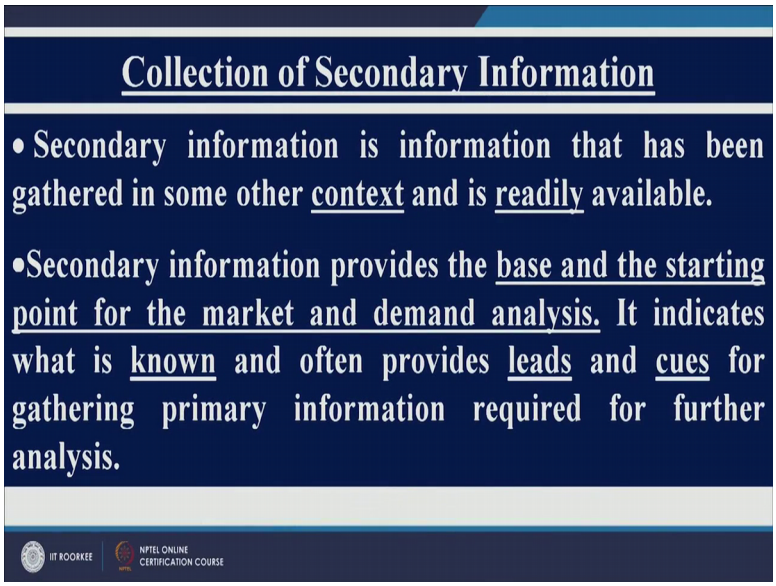

Now, secondary information is basically set of information wherein someone else has done some work and you are trying to get some information from that work right. So, you are not collecting data from your own initially right. So, you are taking reference

from different other works which your predecessor have done right. So, this is this could be one of the starting point of your market and demand analysis. So, you try to find out who are the people who have done similar type of work in past right. So, it indicates what is known and often provide leads and queues for gathering primary information, because the next step after secondary information is primary information. So, you will get an idea from secondary information what kind of primary information you would be requiring for your product or project. So, this is second point in market and demand analysis, you first one was situational analysis and the next one is ok.

Before going for primary type of information collection, let us look at what are couple of sources of secondary data. Because your primary information collect collection process depends on what sources you used for collecting secondary data information. So, what could be the possible sources can you name couple of things. So, there are multiple sources available. So, let us say are if you want to do any business right. So, you will always be having the competitors, you can refer what kind of businesses they are doing who are their customers, who are their comparators, who are bankers who are insurance who are logistics service providers and so on right. So, that could be one source then you can have Google is also there right it is always there Google guru will help you in knowing.

What are different sources of secondary data then you have got different books you have a different channels you can read research papers from good journals you can have several government agencies also which come up with several data you let us say you have got a minister finance data RBI data, different let us say state bank of India data, you have got a world bank data you have got IMF data and there are several other sources also. So, you need to try to find out information from those sources first and then move towards data collection towards then go for primary data collection if needed right it is not necessary that you would always be going for primary data collection.

If you are if you think that secondary sources of data are sufficient enough then you need not go for primary data collection right. So, whenever you go for secondary sources you should look at couple of things, you should not blindly get data from secondary source right you need to analyze those sources very carefully. So, you have to evaluate secondary information very carefully and there are several evaluation criteria.

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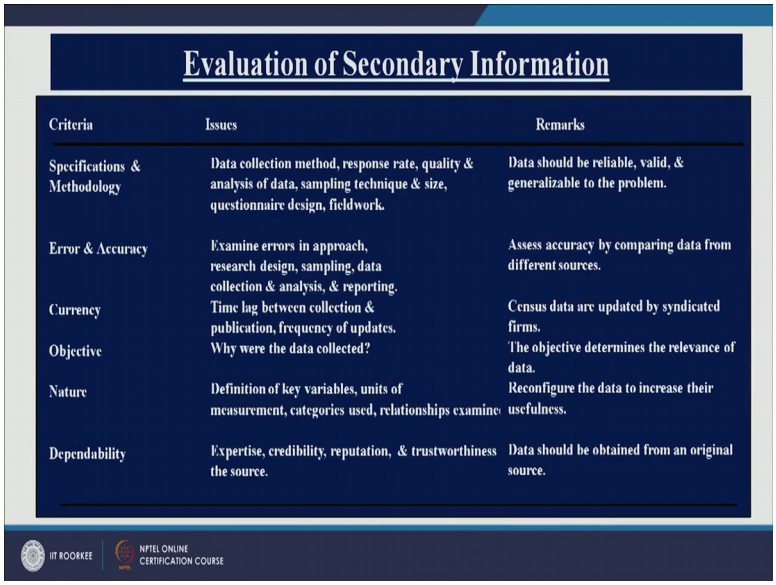

First of all what you should do you should look at who collected the data which you are referring to right what was the response rate, who were the respondents, how data were analyzed by that time, what was the sampling technique was it up random sampling or let us say some non probabilistic sampling let us say a convenience sampling right what was the sample size why was that particular sample size who designed questionnaire.

How many questions were there in that questionnaire, who did the field work right who collected data and so on. So, you need to look at specification and methodology very carefully before getting any data from secondary source right. You should also look at error and accuracy of that particular source. So, if there are some errors then what is the level of that error is that level of error acceptable to you if yes take it otherwise do not take it right. So, you can have issues like let us say research design whether it was exploratory research design or conclusive resource design and let us say then the next point can be currency right this is the next criterion right.

So, how updated that data is right. So, the time lag between now and when that data was collected when that data was analyzed. So, that time lag is very important, you should not collect too old data right of course, you can have you should have recent data and if possible try to have time series type of data right so, that you can find out trend in that data set right. So, look at this currency right how updated or how old the data set is right then you should also look at objective; what was the objective of the research are the

purpose of data collection that time is if the objective of data collection that time and objective of your study is same then it is good to get secondary data, otherwise not right. You should also look at nature of secondary data for example, important key variables write key questions and how many questions were there in that that particular research.

What was the unit of measurement, weather data were collected on let us say it is a nominal scale or let us say ordinal scale or some other scale right and what kind of the data analysis tools used by earlier research researchers. Then you should also look at dependability whatever source you are referring to should be credible it should be a reputed one and it should be trustworthy. So, do not blindly go for secondary sources evaluate those sources carefully on all these criteria and then go for taking data from those sources right. Now you need to of course, you have evaluated a secondary data, but sometimes they are not accurate, sometimes they are not relevant, and sometimes are not reliable.

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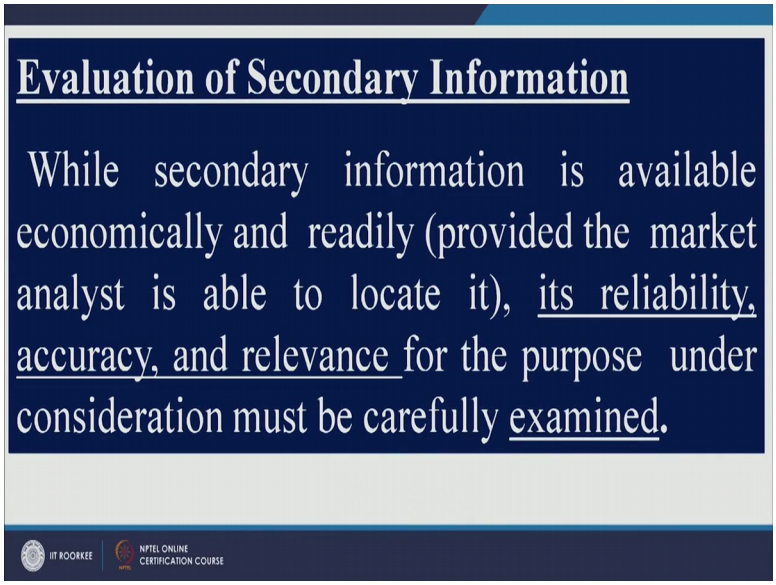

So, what you need to do is you need to go for primary information right. So, if secondary sources are good enough then there is no need, but if you think that some more data need to be collected then go for primary data collection right and that is known as market survey right. As I said if your secondary sources do not provide all the information which you are seeking then go for market survey or primary data collection.

Sometimes you need to go for market survey because you want to some supplement whatever work the earlier people have done right. So, you will have some confidence right it would be a kind of validation of the previous work. So, what kind of information generally you sort in market survey. So, most of the things you have already done in secondary survey right, but if something is missing and if you think that something is not updated, something is not reliable then you can go for market survey right. So, what are the things you would be looking in this? You can look at what is the total what would be the total demand of the product right would be the customers what would be their social economic background, what are the needs which are which have not been fulfilled.

So, you just identify those needs and try to fulfill them what would be the motives for buying your product by the customers right. So, you should look at all these things in primary data collection process right. So let us look at couple of steps in primary data collection process or market survey.

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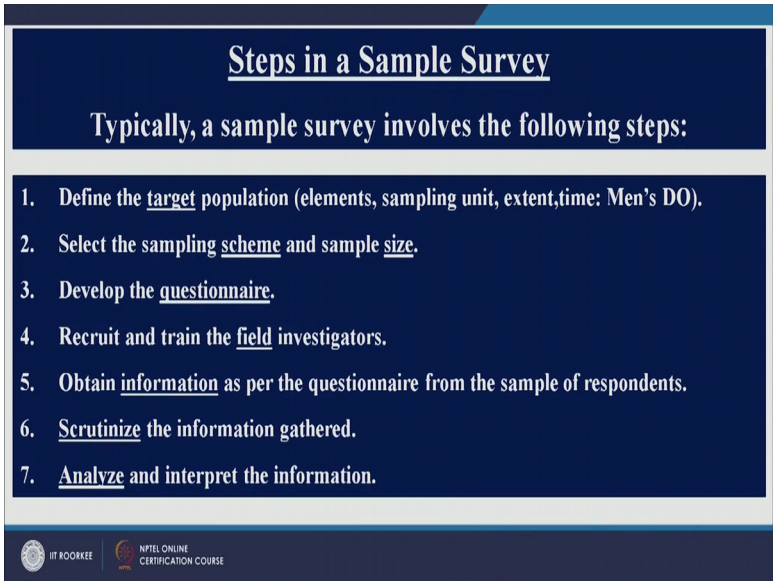

So, first of all you need to define target population it is not population right population is everything all the elements are covered in population, but in target population is a part of population right. So, let us say if I want to know what would be the demand of razor blade right for shaving right. So, the I would not say that all the man who live in India is my target population the target population, would be let us say those people who go for saving right. So, that would be the target population and target population is to be

defined in terms of elements, in terms of sampling unit, in terms of extent to what extent you your target population is and the time right.

So, target population is very important right it is not population right. So, identify your target population then select appropriate sampling method and appropriate sample size develop the questionnaire collect data and if the sample size small you can collect data, otherwise you will have to employee field workers. So, those field workers would be collecting data on your behalf right. Obtain information which you want to from questionnaire, scrutinize data once you have done the data collection process because there would be several missing data also right and you need to analyze those missing data very carefully right because if missing data is it is too large then it would give you wrong results at the end of the day right.

So, how you are looking at missing data right and then finally, you need to analyze and come up with findings right.

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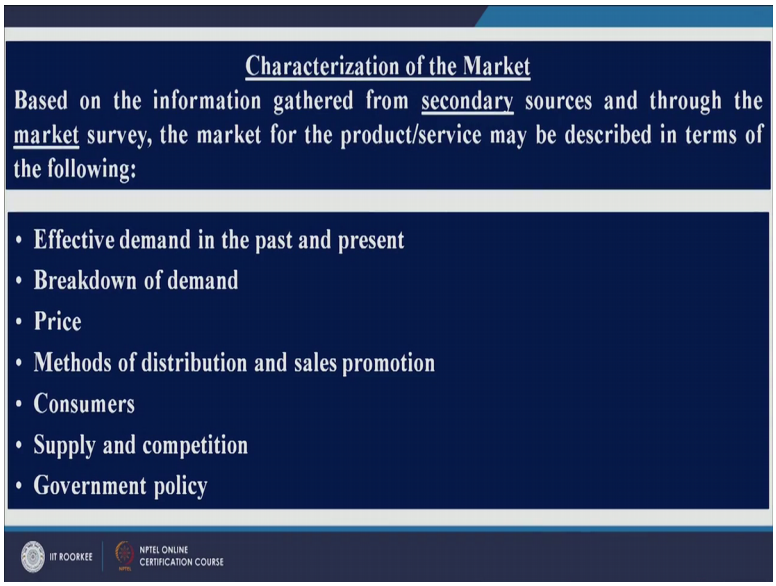

So, these are couple of steps in simple survey, the next step is characterization of market. So, now, you are you are done with secondary data, you are done with primary data now what? Now once you are done with these two things now you just said you just come up with that this the effective demand of my product right which you are going to launch right. And once you have got the aggregate demand you need to break it down for

example, let us say Maruthi has produced 12 lakh cars in to 2018 right. So, they can break up that demand into different models right let us say model a would be having this much demand model b would be having this much demand and so on right. What would be the price of the product or it be same as the price of the competitors or less than or more than that right. So, what would be the methods of distribution, what would be your supply chain how you would promote your products, you need to look at all marketing issues here and you need to closely look at government policies which are which would be affecting your business right. So, this is known as characterization of the market right.

So, with this let me summarize what we have done in this session we will again go through some of the important points which we have seen in this lecture right. So, what we have done here is I have shown you how to use AHP calculator this AHP calculator is available on Google, you just type AHP calculator you will get AHP calculator then first of all what you are supposed to do you just decide how many rows and columns are there at. So, initially it would it would be a square matrix right.

So, write down the size of your matrix, once you submit you click the submit button you will have 4 by 4 matrix are 3 by 3 matrix or whatever it is right. So, go for data entry and data entry as I said h it would be on since you have collected data on nine point sati scale. So, you would be doing data entry keep in mind that let us say if you are collecting data on first pair let us say rice and delivery right and there are 50 experts and each of those have given different value on 9 point sati scale right. So, how to select one particular value in that particular cell that is again you have to be very careful right.

So, either you go for mode right if possible to try to have consensus right otherwise you can go for mode you can also take geometric mean I will tell you in a couple of next sessions why you should take geometric mean right. So, once you are done with data entry you need to click again on submit button you will get different bases right. So, this is what we did in AHP calculator, we have also seen market and demand analysis and their interrelationship. So, the first thing what you should do is situational analysis right. A broad picture of the product which you are going to launch right because you do not suddenly you know start doing business right you have to prepare a lot right. So, there is something called situational analysis right.

So, the major points in situational analysis are you need to identify your who would be your possible customers, who are your competitors, you are middle man right and other stakeholders also and you need to identify their requirements then go for collection of secondary data, this is very important step secondary data you will have multiple sources sometimes you have got government sources, sometimes you have got private sources. So, you need to look at the reliability trustworthiness and how secondary data are right are they updated who collected that data what was the sampling method, what was the sample size, what were the important questions, how those questions were analyzed, what is statistical tools were used. So, you should look at all those data all those points carefully in secondary data then you go for market survey. In market survey as I said it is not always necessary, but if you think that the information which you need from secondary sources if not sufficient then go for market survey right.

So, in market survey you are going in details right and then finally, you are characterizing the market and then demand forecasting. So, in next session we will see what are different methods of demand forecasting; because sometimes you have passed data with you and many times you do not have any data, Let us say if you are coming up with entirely new product then you would not have passed cells data right. So, what to do in situation like this and if you have got past data what to do with past data.

So, there are different forecasting methods and we will see methods like moving average method exponential moving average method if time permits we will go for a methods like let us say holts model we will see winters model and we will try to take up couple of questions also and with this let me complete this session. I hope you would have understood whatever I have taught in this session so.

Thank you very much.